DISCUSSION OF THE CLAIMS

Support for amended Claim 1 is found in Figure 1, α (%) at 300 hrs.

Support for amended Claims 21-22 is found at specification page 36, line 1 to continuing page 37, line 9, in Figure 1, Ex. 1-1 from 80 to 100 hrs and in Figure 2, Ex. 2-1 from 80 to 100 hrs, and in previously presented Claims 21-22.

No new matter has been added.

REMARKS/ARGUMENTS

The rejection of Claims 1, 5-6, 12-16 and 18-22 under 35 U.S.C. 103(a) as being unpatentable over Ono (US 4,483,940) in view of Buscaglia et al (Journal of Materials Science 1996, 31: 5009-5016) and Fukuda et al (JP 2002-145659) is traversed.

Ono discloses a method of manufacturing a honeycomb carrier. However, as the Office recognizes, One fails to teach a honeycomb carrier having $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) and an alkalifeldspar of $(Na_xK_{1-x})AlSi_3O_8$. *See* Office Action, page 2. Buscaglia discloses decomposition of $Al_{2(1-x)}Mg_xTi_{(1+x)}O_5$ with x = 0.0, 0.1, 0.2, 0.4, 0.5 and 0.6 in the temperature range of 900 to 1175 °C after being held for 250 hrs as follows.

TABLE I Decomposed fraction of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ after 250 h treatment at different temperatures

T (°C)	x = 0	0.1	0.2	0.4	0.5	0.6
1175	1	0	0	0	0	0
1150	1	0.03	0	0	0.31	0
1125	1	0.96	0.01	0.08	1	0
1100	1	1	0.08	0.31	1	0
1000	1	1	0.72	1		0
900	0.84	0.1	0	0		0

(16%) of titanate is still present. Decomposition of the solid solution with $x = 0.6$ was not observed in the range 900–1175 °C. For $0.1 \leq x \leq 0.5$, the decomposition degree strongly depends on the annealing temperature. Solid solutions with $x = 0.2$ and 0.4 are stable at lower temperatures than those with $x = 0.1$ and $x = 0.5$; however, decomposition always occurs for $x \leq 0.5$ when the temperature goes below 1125 °C. At 900 °C, the decomposition is reduced or even inhibited ($x = 0.2$ and 0.4), probably because of kinetic effects.

As disclosed above, Buscaglia clearly teaches away from $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) because decomposition always occurs for $x \leq 0.5$. Thus, in light of the teachings of Buscaglia, one of ordinary skill in the art would not even consider $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) for a honeycomb carrier which requires a long term stability. Despite such teachings of Buscaglia, the Office asserted that the example of Buscaglia where x = 0.2

at T = 1100 °C, shows decomposition of 8% and that thus Buscaglia still shows a good decomposition property when $0< x \leq 0.5$. *See* Office Action page 9. In fact, as to the decomposition property at x = 0.2, Buscaglia discloses as follows. *See Buscaglia*, at 5014, right. Col., lns. 41-51, emphasis added.

> "However, the thermal stability should be tested for times longer than 250h to assess the effective reliability of such a material in potential application. Among the Al_2TiO_5 richer materials, the composition with x = 0.2 offers a better thermal stability, but prolonged exposure to temperatures in the range of 900-1000 °C should be avoided in any case."

Thus, Buscaglia *clearly and unambiguously* teaches away from using $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) for prolonged exposure, and in particular for exposure for 250 hrs or longer. Applicants respectfully note that MPEP 2141.02 VI describes, in part, that "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." Furthermore, Buscaglia discloses that "thermal stability should be tested for times **longer than 250h** to assess the effective reliability of such a material in potential application" as disclosed above. Thus, in Buscaglia, there is no disclosure or suggestion as to $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) when the material is exposed at 1100 °C for 300 hrs as in amended Claim 1. Thus, 1) neither Ono nor Buscaglia even suggest the decomposition property of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) when the material is exposed at 1100 °C for 300 hrs or longer. Furthermore, 2) neither of them disclose or suggest the decomposition property of a honeycomb carrier having $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) and an alkalifeldspar of $(Na_xK_{1-x})AlSi_3O_8$. In particular, 3) neither of them disclose or suggest that a remaining ratio α (%) of the aluminum magnesium titanate honeycomb carrier is higher than the remaining ratio α (%) of an aluminum titanate honeycomb carrier after both the aluminum magnesium titanate

honeycomb carrier and the aluminum titanate honeycomb carrier are held at 1100 °C for 300 hrs as in amended Claim 1.

To the contrary, as disclosed in the Declaration of September 13, 2010, Applicants show that more than 80 % of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) decomposed when the material was exposed at 1100 °C for 500 hrs. As discussed above, Buscaglia warned that "thermal stability should be tested for times **longer than 250h** to assess the effective reliability of such a material in potential application.." Applicants show that the decomposition property of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) was indeed extremely poor at prolonged exposure. However, Applicants have discovered that the decomposition property of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) can be surprisingly improved by addition of an alkalifeldspar of $(Na_xK_{1-x})AlSi_3O_8$ so that a remaining ratio α (%) of the aluminum magnesium titanate honeycomb carrier is higher than the remaining ratio α (%) of an aluminum titanate honeycomb carrier after both the aluminum magnesium titanate honeycomb carrier and the aluminum titanate honeycomb carrier are held at 1100 °C for 300 hrs as in amended Claim 1 and as further shown in Figure 1. Thus without the experiments, discovery and subsequent teachings of Applicants, in light of the teachings of Ono and Buscaglia, one of ordinary skill in the art would not have foreseen a honeycomb carrier as in amended Claim 1.

Fukuda discloses adding alkalifeldspar to a mixture of TiO_2 and Al_2O_3. However, Fukuda does not disclose or suggest 1) $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$), 2) the decomposition property of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) when the material is exposed at 1100 °C for 300 hrs or longer, 3) the decomposition property of a honeycomb carrier having $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) and an alkalifeldspar of $(Na_xK_{1-x})AlSi_3O_8$ and 4) a remaining ratio α (%) of the aluminum magnesium titanate honeycomb carrier higher than the remaining ratio α (%) of an aluminum titanate honeycomb carrier after

both the aluminum magnesium titanate honeycomb carrier and the aluminum titanate honeycomb carrier after being held at 1100 °C for 300 hrs as in amended Claim 1.

The combined teachings of Ono, Buscaglia and Fukuda, at most, provide nothing more than an "obvious to try" argument. As explained in MPEP 2145: "An "obvious to try" rationale may support a conclusion that a claim would have been obvious where one skilled in the art is choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success. " *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1397 (2007). In the present case, none of Ono, Buscaglia, and Fukuda disclose or suggest a honeycomb carrier having $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) and an alkalifeldspar of $(Na_xK_{1-x})AlSi_3O_8$. Furthermore, Buscaglia teaches away from $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) and further teaches away from the prolonged exposure of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$). None of the references disclose or suggest a remaining ratio α (%) of the aluminum magnesium titanate honeycomb carrier higher than the remaining ratio α (%) of an aluminum titanate honeycomb carrier after both the aluminum magnesium titanate honeycomb carrier and the aluminum titanate honeycomb carrier after being held at 1100 °C for 300 hrs as in amended Claim 1. Thus, the combined teachings of Ono, Buscaglia and Fukuda do not even present *a prima facie case* of obviousness.

Withdrawal of the rejection is respectfully requested.

The rejection of Claims 4 and 17 under 35 U.S.C. 103(a) as being unpatentable over Ono (US 4,483,94) in view of Buscaglia et al (Journal of Materials Science 1996) and Fukuda at al (JP 2002-145659) and further in view of Noda (US 2001/0056034) is traversed.

The secondary reference to Noda does not cure the deficiencies of Ono, Bucaglia, and Fukuda. Noda does not disclose or suggest 1) $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$), 2) the decomposition property of $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) when the material is

exposed at 1100 °C for 300 hrs or longer, 3) the decomposition property of a honeycomb carrier having $Mg_xAl_{2(1-x)}Ti_{(1+x)}O_5$ (wherein $0< x \leq 0.5$) and an alkalifeldspar of $(Na_xK_{1-x})AlSi_3O_8$ and 4) a remaining ratio α (%) of the aluminum magnesium titanate honeycomb carrier higher than the remaining ratio α (%) of an aluminum titanate honeycomb carrier after both the aluminum magnesium titanate honeycomb carrier and the aluminum titanate honeycomb carrier after being held at 1100 °C for 300 hrs as in amended Claim 1. Thus, the combined teachings of Ono, Buscaglia, Fukuda and Noda do not render obvious amended Claim 1 and the dependent claims therefrom.

Withdrawal of the rejection is respectfully requested.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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